10. (Amended) A composition as claimed in claim 9 wherein the microemulsion comprises droplets having a size of about 100 to about 200 angstroms.

REMARKS

The amendments to the claims presented hereinabove are necessary because they correct several typographical errors that rendered certain of the claims grammatically incorrect and/or unclear. The amendments were not earlier presented because they were first discovered by the undersigned in early August 2003 shortly after the present application was forwarded to his care by the present owner of the instant application, International Environmental Products, LLC.

The proposed amendments raise no new issues or new matter that would require further search and/or consideration by the Examiner. All of the subject matter of the proposed claims was previously claimed in both the original and once-amended claims and thus was previously considered by the Examiner.

The proposed amendments also place the application in better form for appeal in the event the Examiner is not persuaded by Applicants' arguments in favor of patentability presented below.

For these many reasons, Applicants kindly request that the amendments be entered regardless of whether an appeal becomes necessary.

Turning to the Final Office Action, at the sixth paragraph on page 3 thereof, the Examiner requested a copy of the OSHA

(Occupational Safety and Health Administration) exposure list cited on page 6, lines 5-6 of the specification and a copy of the definition of "non-toxic" in SARA (Superfund Amendment and Reauthorization Act of 1986) Title III, Section 313 cited on page 18, lines 7 and 24 of the specification.

SARA Title III, Section 313 and related federal environmental laws do not specifically define "non-toxic" chemicals. However, they do provide lists of chemicals that are deemed to be toxic and therefore subject to certain federally mandated public safety reporting requirements, e.g., the MSDS (Material Data Safety Sheets) required by Title III, Section 313 of SARA. The enclosed copy of 40 C.F.R. § 372.65 identifies toxic chemicals that OSHA and others use to establish safe exposure standards. And, the enclosed copy of the EPA (Environmental Protection Agency) "List of Lists" identifies those toxic chemicals that are subject to SARA Title III, Section 313 reporting requirements. While a lay reader might incorrectly interpret Applicants' specification at page 18 to suggest that the term "non-toxic" is a defined term under SARA Title III, Section 313, it is not. However, one of ordinary skill in the art of petroleum spill cleanup practices is fully aware that SARA Title III, Section 313 clearly establishes, if not specifically defines, what is a "non-toxic" chemical: that is, if a chemical is not on the list of chemicals subject to MSDS reporting, it is non-toxic under SARA Title III, Section 313. Accordingly, persons of ordinary skill in the relevant art will readily appreciate what is meant by the term "non-toxic" as used in association with SARA Title III, Section 313 at page 18, lines 7 and 24 of the specification.

Incidentally, the Examiner will note that ethylene glycol, the only diluent or solvent specifically identified in the formulation examples discussed in U.S. Patent No. 4,460,692 to Tellier et al. (discussed below), is listed as a toxic chemical under 40 C.F.R. § 372.65 and is subject to the reporting requirements of SARA Title III, Section 313 (see the "List of Lists" at pages 11 and A-21). The significance of this fact will be addressed in detail below.

Claims 1-3, 5-12, 14, 16-18, 20, 21, 23 and 24 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tellier et al. (U.S. Patent No. 4,460,692, hereinafter "Tellier"). Such rejection is respectfully traversed.

For the Examiner's convenience, twice-amended independent claim 1 is reproduced herebelow (with emphasis added):

> 1. (Twice Amended) A composition for treatment of pollution comprising:
>
> a first component comprising a non-toxic, non-flammable, microorganism assimilable carbon containing substance in an oil phase;
>
> a second component comprising a non-toxic nutrient in a water phase, the second component being formed as an emulsion within the first component; and
>
> a third component comprising a diluent added to the first and second components, the diluent comprising a non-toxic, nonflammable, microorganism assimilable carbon containing compound which is soluble in the first component and is selected to facilitate viscosity stabilization for extended storage,
>
> wherein the combination of the first, second and third components provide an initial source for

culturing microorganisms present in a pollution site being treated.

As the Examiner is aware, in order to sustain a rejection under 35 U.S.C. § 102(b) a reference must specifically or inferentially disclose every feature or element of a claim. As demonstrated below, the Tellier patent clearly does not satisfy this mandate with regard to Applicants' sole independent claim, claim 1. In particular, Tellier does not disclose or suggest a bioremediation microemulsion in which all of its constituent components are non-toxic and nonflammable and whose diluent is selected to impart long term viscosity stability to the composition. This are fundamental aspects of Applicants' invention. Applicants purposely sought to develop a composition that overcomes the toxicity and flammability problems of prior bioremediation compositions that precluded their use in both open and enclosed environments. These are very critical safety issues since it is intended that the composition of the present invention be available for use in an enclosed environment such as a building. Non-toxic and non-flammable components are of paramount importance in the use of such a composition within a closed space.

Applicants also purposely sought to develop a bioremediation composition that has long-term viscosity stability, which translates to prolonged product shelf life. The advantage of a long shelf life is that it enables the product to be shipped, stored and used a considerable time after its manufacture. As explained later, this beneficial feature enables Applicants' product to be to be sold in very large to very small quantities whereby it may be used in all sorts of industrial, commercial and residential applications.

Like Applicants, Tellier discloses a bioremediation microemulsion of the water-in-oil type. The internal phase of the microemulsion is an aqueous solution of nutrient materials and the external phase is a liquid immiscible with water. The microemulsion is added to a hydrophobic layer to be degraded. Beyond that, the similarities between Tellier and Applicants' claimed invention effectively end.

Essentially, Tellier describes techniques for combating outdoor pollution, especially marine pollution. This is consistent with the fact that in 35 of the 37 composition examples provided in the Tellier patent which do include a solvent or diluent (Examples 1 and 2 do not), the solvent used is the butyl ether of ethylene glycol. As noted above, ethylene glycol is a toxic chemical listed in both the EPA's "List of Lists" and 40 C.F.R. § 372.65.

The Examiner rightly asserts that the teachings of a reference are not limited by its examples. However, at least one passage in Tellier implies that he is unconcerned as to the type of diluent that may be used in his composition (which is not surprising for a bioremediation that is to be used outdoors). See, for example, column 3, lines 51-55 which state:

> The viscosity of the microemulsion can be considerably reduced by the addition of an alcohol, particularly C_6 to C_{12}, an ether or an ester of a polyol, particularly glycol. This considerably facilitates manipulative operations.

In contrast, other passages make it clear that the preferred solvent is the butyl ether of ethylene glycol, a toxic which can only be used in outdoor applications.

> It is nevertheless recommendable to add liquids permitting reduction of the viscosity of the microemulsion. Various examples of such additives have been cited above. In a particular embodiment of the invention, the butyl ether of ethylene glycol has given excellent results.

Tellier, column 4, lines 61-66.

> As regards viscosity, it was found that, without the addition of the butyl ether of ethylene glycol, it is very high (Examples 1 and 2). In contrast, this addition reduces it to very acceptable values (Examples 3 to 11).

Tellier, column 6, lines 64-68.

Furthermore, lest there be any remaining question whether the Tellier formulation is intended for indoor applications, Applicants wish to address a passage in the Tellier patent that might lead one to the erroneous conclusion that the Tellier formulation may be used indoors. That passage is found at column 4, lines 22-29 and is reproduced herebelow (with emphasis added).

> While the invention is of great interest for various operations of biodegradation effected outdoors, it can also be of use in various manufacturing operations in vessels, whenever a hydrophobic layer of a substance is employed in the process. For example, it applies advantageously in the manufacture of proteins from hydrocarbons by degradation of the latter with the aid of bacteria and/or fungi.

The current owner of the present application, International Environmental Products, LLC, is aware of only one process in which a commercialized version of the invention disclosed by Tellier was used by industry in other than an outdoor

bioremediation application. That process was also a bioremediation process. However, it was performed in a hermetically sealed container known as a "bioreactor vessel." In that process, the offending petroleum was transported from the contaminated outdoor site to the bioreactor vessel wherein it was brought into contact with the Tellier microemulsion. Bioremediation was thus conducted in the sealed bioreactor vessel as opposed to outdoors. Accordingly, it would be utterly incorrect to equate bioremediation that is conducted in a sealed bioreactor vessel with bioremediation that can be conducted in the open air within a building or other wholly or partially enclosed space.

In addition, the commercialized version of the Tellier product was the Inipol technology discussed in the paragraph bridging pages 3 and 4 of Applicants' specification (specifically Inipol EAP22 manufactured by the assignee of the Tellier patent, Societe Nationale Elf Aquitaine (now "Atofina")). As noted by Applicants in that paragraph, the Inipol technology contains a toxic stabilizer (i.e., solvent or diluent) that exceeds OSHA exposure limits. Because of this, the Inipol technology by law cannot be used in the United States in open-air indoor bioremediation in industrial plants and other enclosed areas.

Equally as important, Tellier does not address the issue of flammability, defined by OSHA as having a flash point above 100°F ASTM Closed Cup flammability test. This stands to reason when one considers that the Tellier product was developed for outdoor uses in general and for marine uses in particular. Evidencing Tellier's lack of concern with regard to flammability, he states that C_6 to C_{12} alcohols, among other compounds, may be used as

viscosity reducing agents. C_6 to C_{12} alcohols are all highly flammable. The following passages underscore this point.

> Among applications in the open, water or ground areas, the most important is the degradation of hydrocarbons distributed accidentally. For the reason explained above, that is the fact that the soluble nutrient substances remain in the layer treated instead of being entrained by the water, the invention has a considerable value for combatting marine pollution.

Tellier, column 4, lines 35-41 (emphasis added).

> Thus, microemulsions according to the invention allow a degradation of more than 80% of crude petroleum distributed on seawater to be obtained, for example, in seven days, when the nutrient solution contains urea or amino-acids.

Tellier, column 6, lines 35-39 (emphasis added).

See also EXAMPLES 20, 21 and 23-37 at columns 7-11 of Tellier which are specifically directed to tests showing the beneficial results in remediating oil spilled on seawater.

It thus comes as no surprise that Tellier was unconcerned about the flammability characteristics of his product since it was obviously developed as a means to remediate outdoor oil spills, particularly marine spills. It cannot be fairly asserted, therefore, that Tellier expressly or impliedly teaches any advantage in assuring that a bioremediation formulation be non-flammable.

Applicants describe in great detail the serious disadvantageous of existing prior art bioremediation compositions, e.g., exposure and transportation problems associated with flammable

and/or toxic chemicals. Please see, for example, page 3, line 24 to page 5, line 13. The products taught by the Tellier disclosure suffer these same limitations. The claimed invention improves upon the type of composition disclosed or suggested by Tellier by specifically requiring that the all of its components be both non-toxic and non-flammable in order to eliminate or substantially reduce the toxicity and flammability problems associated with existing bioremediation materials such as those taught by Tellier.

Another factor which limits the use of commercial products of the type described in Tellier, i.e., the Inipol product, is their comparative lack of viscosity stability. The compounds set out in Tellier for the purpose of reducing viscosity do not result in a stable and useable liquid over time. The present owner of the instant application, International Environmental Products, LLC, avers that the Inipol product has a shelf life of a few weeks whereas the presently claimed invention has the ability to extend the shelf life and temperature stability of the composition for application to polluted surfaces over a considerable period of time. See page 18, lines 16-21 of Applicants' specification which state that the composition maintains a stable viscosity, i.e., it does not thicken, whereby it has a shelf life of 6 months or more.

Taken as a whole, therefore, Tellier teaches that (1) solvents or diluents are optional, (2) if solvents are present, they may be any one of an alcohol, particularly C_6 to C_{12}, an ether or an ester of a polyol, particularly glycol, (3) toxic butyl ether of ethylene glycol is the preferred solvent, and (4) flammability of the composition is not a concern. Applicants respectfully submit that, in totality, the combination of these teachings does not constitute either explicit or implicit

disclosure of a bioremediation microemulsion having a mandatory diluent component that is both non-toxic and nonflammable and that promotes long term viscosity stability, whereby the product may be used for both outdoor and indoor applications.

It is not lightly to be assumed that the combination of compounds that achieve Applicants' very beneficial objectives may be inferred or divined from Tellier. Rather, the opposite is true. Applicants' were aware of the Tellier patent and the Inipol product, yet the present invention required considerable investigation and testing to produce an effective formulation that realized all of the disclosed and claimed features of their invention. The end result was a highly effective bioremediation product having long lasting viscosity stability that is safe for use both indoors and out as well as in fire hazardous environments. Tellier's disclosed compositions simply did not and do not satisfy these requirements.

Moreover, the many beneficial aspects of Applicants' claimed formulation open up significant mew markets for bioremediation products that would be unavailable to products such as Tellier's (which are burdened with excessive toxicity and flammability and which have unacceptably short shelf lives). Specifically, Applicants' product may be used by industrial, commercial and even residential users with complete safety and ease. For instance, a retail consumer may use Applicants' product to safely remove automobile grease or oil deposits from his or her garage floor. Because Applicants' product may be formulated to have a viscosity whereby it may be sprayed from a pump-type spray bottle, for example, a user may simply spray the target area and allow the product to perform its bioremediation function. And, because of its long and practical shelf life, the end consumer is able to store and reuse any unused product for many months

after purchase. These features make Applicants' claimed composition far more commercially versatile than those taught by Tellier.

For these many reasons, the presently claimed invention represents a significant, unanticipated and patentable departure from the compositions described by Tellier. To conclude, it is clear that the Tellier patent does not and cannot be fairly construed to anticipate the present invention as most broadly recited in independent claim 1. Accordingly, Applicants kindly submit that the outstanding rejection of claim 1 and its dependent claims 2, 3, 5-12, 14, 16-18, 20, 21, 23 and 24 under Section 102(b) in reliance upon Tellier is improper and should be withdrawn.

Claims 1, 2, 5, 8, 11, 12 and 16-23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Freiesleben (U.S. Patent No. 5,171,475). Such rejection is respectfully traversed.

Freiesleben is easily differentiated from the presently claimed invention. Most importantly, the Freiesleben product is a conventional degreaser or cleaner rather than a bioremediation formulation. Freiesleben is silent as to any disclosure or suggestion of microorganisms playing a role in the petroleum cleanup process. Moreover, although the Freiesleben patent is entitled SOIL-REMOVAL MICROEMULSION COMPOSITIONS, the "soils" described throughout the patent are not earthen soil, or the like, from which unwanted petroleum products are to be removed. Rather, they are the petroleum products themselves. See, for example, EXAMPLE 1, "Soil Removal Assessment" at column 9, line 31 through column 10, line 16 which is reproduced below.

> Standard tarsand soils were prepared by smearing 2.5 cm X 2.5 cm X 0.3 cm tarsand (alternatively jesco grease or 80-10 mixtures of tarsand and jesco could have been similarly prepared) on Q-panels (i.e., metal testing panels having a Q-shaped hole) and baking the applied soil for 30 minutes at 120°C. The panels were thereafter left to attain atmospheric equilibrium for 24 hours. This procedure is referred to in the claims as Q-panel testing.
>
> Other test soils such as multi-use and automotive greases, gear oils, or automotive under coatings could be prepared for assessment in the same manner.
>
> Finally, test soils could be alternatively prepared as follows: Roofing tars or soils containing plasticizers or any type of soil combination (greases, oils, waxes, etc.) are smeared on metal panels and exposed to the elements (e.g., on roofs or walls) for aging. The applied soil thickness is in all cases controlled via an applicator gauge.

The chemical process by which the Freiesleben composition performs its petroleum cleaning function is set forth at column 4, line 36 through column 5, line 53. Particularly relevant excerpts thereof are reproduced below (with emphasis added).

> It is well known in the art that in order to have effective cleaning agents, the soil to be removed must be penetrated, solvated and removed (sequestrated) from the substrate and dispersed in a cleaning medium. Penetration and dispersion are achieved by surfactants. Ionic surfactants affect the electrostatic properties of the surface to which they adsorb (or film in which they are resident). Nonionic surfactants by orienting their hydrophilic moiety into the so-called Stern layer surrounding a wetted soil particle (assuming the medium is aqueous) promote dispersion and inhibit agglomeration.
>
> Similar principles apply to stabilization of cleaning emulsion compositions. Stability of an emulsion is promoted by surfactants which act as emulsifiers. They should have good solubility in both the aqueous and

> the oil phase. Often, combinations of surfactants are more effective as emulsifiers than single compounds, as is well known in the art. See, generally *Surfactants and Interfacial Phenomena*, M. J. Rosen, Wiley 1978.
>
> The electrical properties of a film or surface are very important in stability of cleaning emulsions and in effectiveness of cleaning ability. The electrostatic surface charges can be measured, but expensive equipment is necessary. A simpler method for optimizing stability and cleaning performance of emulsions is provided below by the present invention.
>
> Refractive index and polarity of a liquid provide a measure of the electrostatic properties of that liquid. The present inventor was able to correlate the cleaning ability of various emulsions to the polarity and refractive index of their ingredients and corresponding concentration of each ingredient in the progenitor solution.

Freiesleben, column 4, lines 36-67.

The foregoing passage is unambiguous about the manner by which the Freiesleben product removes petroleum deposits. The Freiesleben composition functions essentially the same as a typical dishwashing detergent does in penetrating, solvating and dispersing cooking oils and greases. Not surprisingly, the patent most cited in Freiesleben as disclosing surfactants suitable for use in the Freiesleben formulation is U.S. Patent No. 4,414,128. That patent is entitled LIQUID DETERGENT COMPOSITIONS.

Freiesleben does not employ microorganisms that are necessary for bioremediation. As such, he does not teach or suggest, for example, Applicants' second component of independent claim 1, namely:

a second component comprising a non-toxic nutrient in a water phase, the second component being formed as an emulsion within the first component.

Being that the Freiesleben technology does not relate in any way to bioremediation, he does not disclose or suggest any need for or advantage in providing non-toxic nutrients in the inner water phase of his emulsion. In stark contrast, the nutrient-containing inner water phase is an essential ingredient of Applicants' product and must be present for the proper functioning of their invention.

Interpreting Freiesleben, the Examiner states "Compounds containing nitrogen are specified (Table 2)." The Examiner will note that Table 2 is a list of emulsifiers which make up the outer oil phase rather than the inner water phase of the emulsion. Nitrogen present in the outer phase of a water-in-oil bioremediation emulsion would be rapidly metabolized by the microorganisms used in the remediation process. As a consequence, the nutrient supply would be quickly depleted and the bioremediation process would be effectively halted before it could perform meaningful cleanup.

In diametric opposition to Freiesleben, Applicants purposely provide dissolved nitrogen and/or phosphorous containing nutrients in the inner water phase of their microemulsion in order to promote a so-called "timed-release" of the nutrients. The result is a long-lasting, and therefore more effective, bioremediation process when Applicants' emulsion is applied to a contaminated surface. See, for example, Applicants' specification at page 13, line 18 through page 14, line 4.

Additionally, in the paragraph bridging columns 8 and 9 of Freiesleben, he states that optional electrolytes *could* be provided in his emulsion, but he emphasizes that they are not necessary. He also does not state for what purposes they may be used or in what phase of the emulsion they may be incorporated. When reasonably and properly construed, it is clear that that passage simply does not provide express or even implied teaching of (1) a water soluble microorganism nutrient (2) contained in the inner water phase of a bioremediation emulsion for (3) enabling long term nourishment of microorganisms.

Upon reconsideration of Freiesleben, therefore, Applicants' trust the Examiner will agree that Freiesleben cannot be fairly interpreted to anticipate the present invention as most broadly recited in independent claim 1. Accordingly, Applicants kindly submit that the outstanding rejection of claim 1 and its dependent claims 2, 5, 8, 11, 12 and 16-23 under Section 102(b) in reliance upon Freiesleben is improper and should be withdrawn.

In view of the foregoing, the instant application is believed to be in condition for allowance and, therefore, early issuance thereof is earnestly solicited.

If the Examiner believes that a telephone interview would be beneficial to advance prosecution of the present application, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

Date: August 11, 2003

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Marked-up Version of Claims as Submitted by After Final Amendment Dated August 11, 2003.

1. (Twice Amended) A composition for treatment of pollution comprising:

a first component comprising a non-toxic, non-flammable, microorganism assimilable carbon containing substance in an oil phase;

a second component comprising a non-toxic nutrient in a water phase, the second component being formed as an emulsion within the first component; and

a third component comprising a diluent added to the first and second components, the diluent comprising a non-toxic, non-flammable, [micororganism] microorganism assimilable carbon containing compound which is soluble in the first component and is selected to facilitate viscosity stabilization for extended storage;

wherein the combination of the first, second and third components provide an initial source for culturing microorganisms present in a pollution site being treated.

2. (Twice Amended) A composition as claimed in claim 1 wherein the first component is a [micororganism] microorganism assimilable carbon containing composition.

5. (Amended) A composition as claimed in claim 1 wherein the oil phase is a straight chained, lipophilic carbon source.

9. (Amended) A composition as claimed in claim 8 wherein the microemulsion comprises droplets [have] having a size of about 20 to about 400 angstroms.

10. (Amended) A composition as claimed in claim 9 wherein the microemulsion comprises droplets [have] having a size of about 100 to about 200 angstroms.